

Renewable Portfolio Standard Working Group Meeting

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Who is Alliant Energy?

- Alliant Energy serves 1.2 million customers throughout a four-state territory (Iowa, Wisconsin, Minnesota and Illinois)
- Serve approximately 53,000 farm customers.

Generation Diversity

- Coal
- Natural Gas
- Renewable Energy Sources
- Distributed Resources

Alliant Energy's - Wisconsin Biogas Project

- 10 MW generation
- Farm, food processor, landfill & sewage treatment sources
- 3-year project
- 5-year contracts
- 800kW max. per location
- 6 cent/kWh (customer owned), 4.9 cents on-peak, 8.0 cents off-peak

10 Megawatts ?

- 50,000 tons of coal each year
- 500 coal cars
- 5 unit trains
- Enough electricity for ~11,000 homes

Landfill Gas

Food Processing Industry, Environmental Issue

Deere Ridge Farm, Anaerobic Digester,

Amherst, WI

Plug Flow Construction Overview Heat Recovery System

- Utilize heat from exhaust of engine or microturbine
- Heat digester
- Heat buildings
- Heat for anything that needs hot water
- Absorbption refrigeration

Benefits of an Anaerobic Digesters

- Reduce odors 90-95%
- Use gas to generate electricity for use or sale
- Use the heat from the engine to heat digester and for other uses.
- Valuable byproducts
 - Can use solids for high quality compost or bedding
- Reduce greenhouse gas emissions
- Weed seed and fly pest control

OTHER EMERGING BIOMASS OPPORTUNITIES

Biomass Energy Feedstocks

Crop Residue Opportunity

- 116 million tons in corn belt (2001 DOE estimate)
- 150 million tons in USA, 80% as stover
- Options for crop residue
 - Power generation
 - Steam generation
 - Dry mill ethanol plants
 - Direct conversion to liquid fuels

Chariton Valley Switchgrass Project

- Substituting coal for switch grass at 5% level
- 600MW plant, Ottumwa, IA
- Potential for 50,000 acres of switchgrass

Ethanol and Biodiesel Production

A Look At The Ethanol Process

- Syrup is primary contributor to emissions
- Syrup increases drying costs
- Backset reduces through-put

Combustion Application

The Technology:

Fluidized Bubbling Bed combustion (FBB) with waste heat recovery boiler.

The History:

FBB is used for incineration of municipal waste sludge and pulp mill liquors to extract energy value and mineral recovery.

Municipal Waste Sludge:

- 70% nom. moisture content
- 8000 btu/dry lb energy content

The Application:

Patent Pending

BioRefinery

Biomass Challenges

Biomass Project Success Requires

- Favorable power purchase agreements
- Predictable cash flow
- Secondary drivers: waste management or odor control
- Market for secondary products
- Tradable “green qualities”
- Incentives de-coupled from cost of fossil fuels
- Access to financing

Policy Assistance

Reward risk while encouraging demand

- Local- tax incremental financing
- State-federal, purchase of “green” power
- Emission/nutrient management credits
- Voluntary green energy purchase tax credits
- Energy subsidies, such as ethanol and wind have
- CRP allowance for harvest of bio-fuels

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